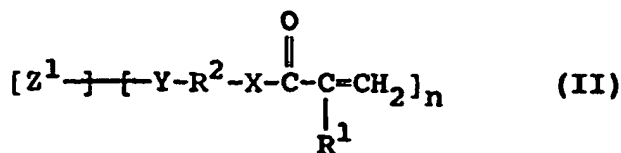
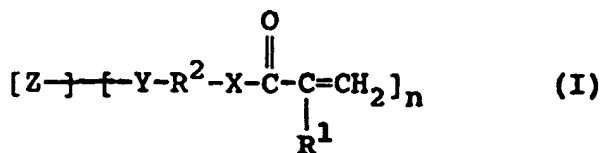




INTERNATIONAL APPLICATION PUBLISHED UNDER THE PATENT COOPERATION TREATY (PCT)

(51) International Patent Classification ⁶ : C07D 301/12, 303/16, 303/20, 303/48, C08F 120/18, 220/18	A3	(11) International Publication Number: WO 98/28286 (43) International Publication Date: 2 July 1998 (02.07.98)
(21) International Application Number: PCT/EP97/07286 (22) International Filing Date: 22 December 1997 (22.12.97) (30) Priority Data: 08/773,524 23 December 1996 (23.12.96) US (71) Applicant (for all designated States except PL US): SAR- TOMER COMPANY, INC. [US/US]; Oaklands Corporate Center, 502 Thomas Jones Way, Exton, PA 19341 (US). (71) Applicant (for PL only): CRAY VALLEY S.A. [FR/FR]; Tour Total, 24, cours Michelet, F-92800 Puteaux (FR). (72) Inventors; and (75) Inventors/Applicants (for US only): CESKA, Gary, W. [US/US]; 310 Long Ridge, Exton, PA 19341 (US). FAN, Mingxin [CN/US]; 49 Sheffield Lane, West Chester, PA 19380 (US). HORGAN, James [US/US]; 805 Copeland School Road, West Chester, PA 19380 (US). (74) Agent: CHAILLOT, Geneviève; Cabinet Chaillot, 16-20, av- enue de l'Agent Sarre, Boîte postale 74, F-92703 Colombes Cedex (FR).		(81) Designated States: CA, CN, JP, KR, MX, PL, US, European patent (AT, BE, CH, DE, DK, ES, FI, FR, GB, GR, IE, IT, LU, MC, NL, PT, SE). Published <i>With international search report.</i> <i>Before the expiration of the time limit for amending the claims</i> <i>and to be republished in the event of the receipt of amendments.</i> (88) Date of publication of the international search report: 13 August 1998 (13.08.98)
(54) Title: UNSATURATED (METH)ACRYLATE ESTERS CONTAINING AT LEAST ONE EPOXIDIZED CYCLIC GROUP AND PROCESS FOR PREPARING THEM (57) Abstract A process of making compounds of formula (I), wherein Z is an unsub- stituted or substituted n-valent cyclic moiety bearing at least one endocyclic oxirane group; Y is O, S, NH, (Ia) or (Ib); R ² is a divalent linking group; X is O, S or NH; R ¹ is H or (C ₁ -C ₆) alkyl; and n is an integer from 1 to 6, Z be- ing mono- to hexavalent respectively, it being possible for -Y-R ² to represent a single bond, comprises reacting a com- pound of formula (II), wherein Z ¹ is a cyclic moiety bearing at least one en- docyclic C=C group; and Y, R ² , X, R ¹ and n are as defined above with hydro- gen peroxide in the presence of (a) tungstic acid or tungsten oxide or molybdic acid or a molybdenum oxide; (b) phosphoric acid or a salt thereof; and (c) at least one phase transfer catalyst.		



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INTERNATIONAL SEARCH REPORT

International Application No
PCT/EP 97/07286

A. CLASSIFICATION OF SUBJECT MATTER

IPC 6 C07D301/12 C07D303/16 C07D303/20 C07D303/48 C08F120/18
C08F220/18

According to International Patent Classification (IPC) or to both national classification and IPC

B. FIELDS SEARCHED

Minimum documentation searched (classification system followed by classification symbols)

IPC 6 C07D C08F C07F C08G C08L C07C

Documentation searched other than minimum documentation to the extent that such documents are included in the fields searched

Electronic data base consulted during the international search (name of data base and, where practical, search terms used)

C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
X	DE 14 18 698 A (CONSORTIUM FÜR ELEKTROCHEMISCHE INDUSTRIE GMBH) 10 October 1968 see examples 1-3 & DATABASE CHEM. ABS. REGISTRY American Chemical Society see RN: 1443-40-9, 1147-02-0, 2389-91-5 ---	16
X	US 3 230 202 A (S.W. TINSLEY ET AL.) 18 January 1966 see compound of claim 7 & DATABASE CHEM. ABS. REGISTRY American Chemical Society see RN: 7534-87-4 --- -/--	16

☒ Further documents are listed in the continuation of box C.

☒ Patent family members are listed in annex.

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"&" document member of the same patent family

Date of the actual completion of the international search

28 May 1998

Date of mailing of the international search report

25.06.98

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INTERNATIONAL SEARCH REPORT

International Application No

PCT/EP 97/07286

C.(Continuation) DOCUMENTS CONSIDERED TO BE RELEVANT

Category	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
X	EP 0 479 166 A (UNION CARBIDE CHEMICALS AND PLASTICS COMPANY, INC.) 8 April 1992 see page 18; example 5 & DATABASE CHEM. ABS. REGISTRY American Chemical Society see RN: 141952-18-3 ---	16
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INTERNATIONAL SEARCH REPORT

International Application No

PCT/EP 97/07286

C.(Continuation) DOCUMENTS CONSIDERED TO BE RELEVANT

Category	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
X	DATABASE WPI Week 9251 Derwent Publications Ltd., London, GB; AN 92-420422 XP002066024 & JP 04 316 566 A (TOSOH CORP.) , 6 November 1992	16
Y	see abstract & DATABASE CHEM. ABS. REGISTRY American Chemical Society see RN: 147768-61-4, 129197-67-7 ---	1
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Y	DATABASE WPI Week 9343 Derwent Publications Ltd., London, GB; AN 93-339772 XP002066025 & JP 05 247 120 A (TOSOH CORP.) , 24 September 1993 see abstract ---	1
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INTERNATIONAL SEARCH REPORT

Int. .ational Application No

PCT/EP 97/07286

C.(Continuation) DOCUMENTS CONSIDERED TO BE RELEVANT

Category	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
X	EP 0 733 637 A (DOW CORNING TORAY SILICONE CO., LTD.) 25 September 1996 see abstract ---	24
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INTERNATIONAL SEARCH REPORT

International application No.
PCT/EP 97/07286

Box I Observations where certain claims were found unsearchable (Continuation of item 1 of first sheet)

This International Search Report has not been established in respect of certain claims under Article 17(2)(a) for the following reasons:

1. ☐ Claims Nos.:
because they relate to subject matter not required to be searched by this Authority, namely:
2. ☒ Claims Nos.: 1,16,21,22
because they relate to parts of the International Application that do not comply with the prescribed requirements to such an extent that no meaningful International Search can be carried out, specifically:
see FURTHER INFORMATION sheet PCT/ISA/210
3. ☐ Claims Nos.:
because they are dependent claims and are not drafted in accordance with the second and third sentences of Rule 6.4(a).

Box II Observations where unity of invention is lacking (Continuation of item 2 of first sheet)

This International Searching Authority found multiple inventions in this international application, as follows:

1. ☐ As all required additional search fees were timely paid by the applicant, this International Search Report covers all searchable claims.
2. ☐ As all searchable claims could be searched without effort justifying an additional fee, this Authority did not invite payment of any additional fee.
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Remark on Protest

- ☐ The additional search fees were accompanied by the applicant's protest.
- ☐ No protest accompanied the payment of additional search fees.

FURTHER INFORMATION CONTINUED FROM PCT/ISA/ 210

Claims Nos.: 1,16,21,22

Expressions like "cyclic moiety" for Z and "divalent linking group" for R2 used in the claims are too vague to allow a comprehensive and satisfactory search which is economically reasonable (See Guidelines for Examination in the EPO, B-III, 2). Consequently the search has been limited to the scope illustrated by the examples.

INTERNATIONAL SEARCH REPORT

Information on patent family members

International Application No

PCT/EP 97/07286

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International Application No

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